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(54) Shower spray head

(57) A shower spray head 1 which is operable to provide at least four selected alternative water flow paths and possible combinations of selected two flow paths has a first housing part 4 attachable to a source of fluid under pressure and a second housing part 5 including an apertured valve plate 11 fixedly connected thereto which is movable by rotations of the second valve part 5 about an axis 6 to co-operate with valve port means 12 on the first housing part 4 to provide the selected desired fluid flow paths. In operation the second housing part 5 can be moved to positions providing a first fluid flow path in which a vibrator turbine rotor 7 is driven by the fluid to produce vibration of a vibrator portion 8 to which an accessory can be attached, a second fluid flow path in which a pulsator turbine rotor 9 is driven by the fluid to produce a pulsating fluid flow, a third flow path which produces a non-pulsating fluid flow or a fourth flow path which produces an aerated fluid flow.

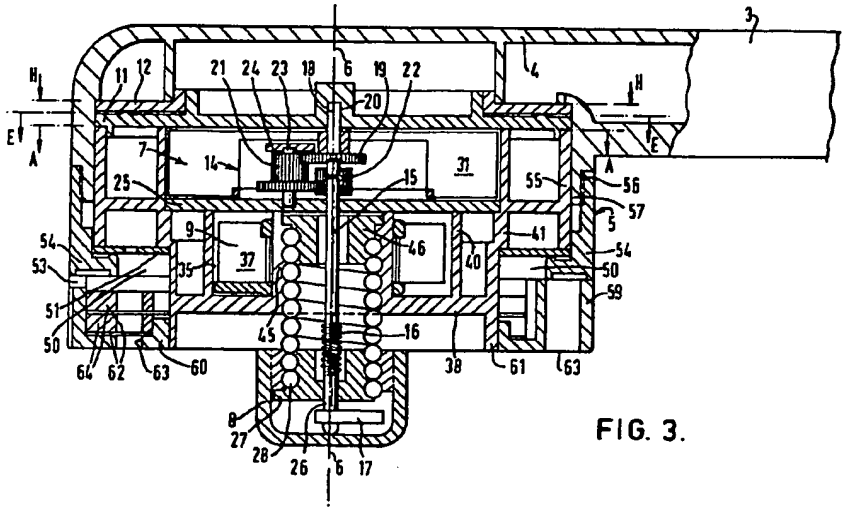

FIG. 3.

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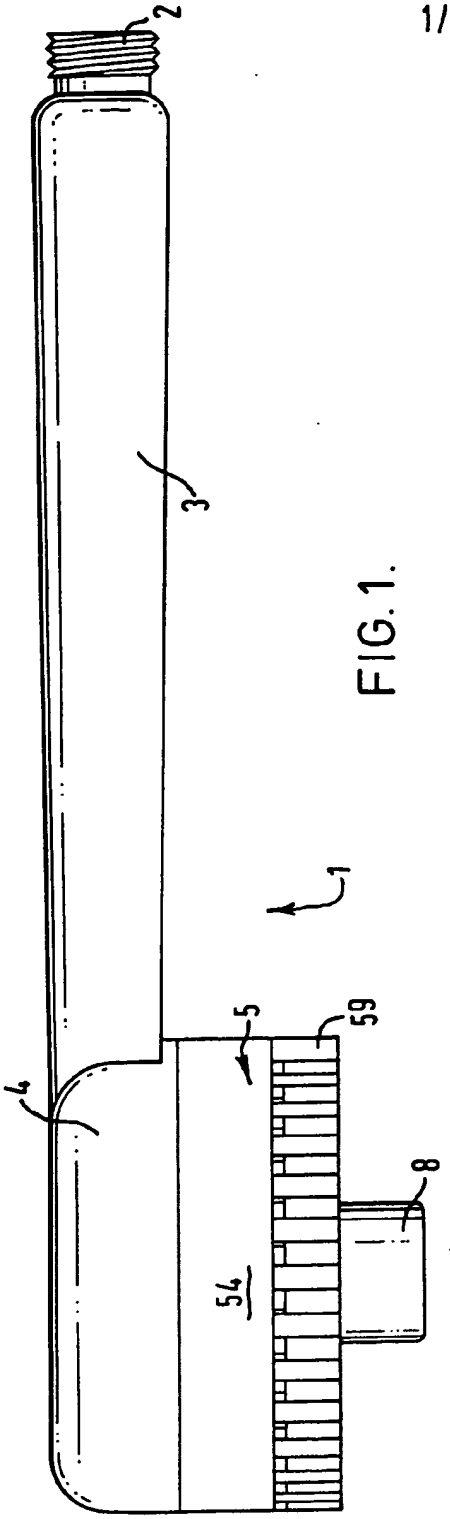

FIG. 1.

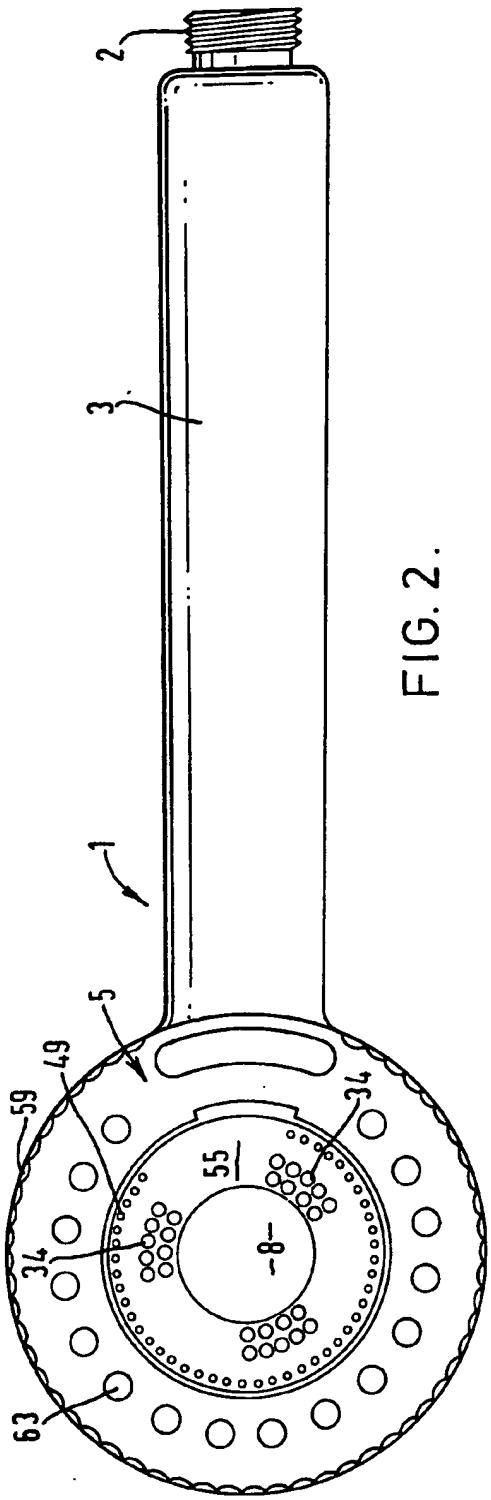

FIG. 2.

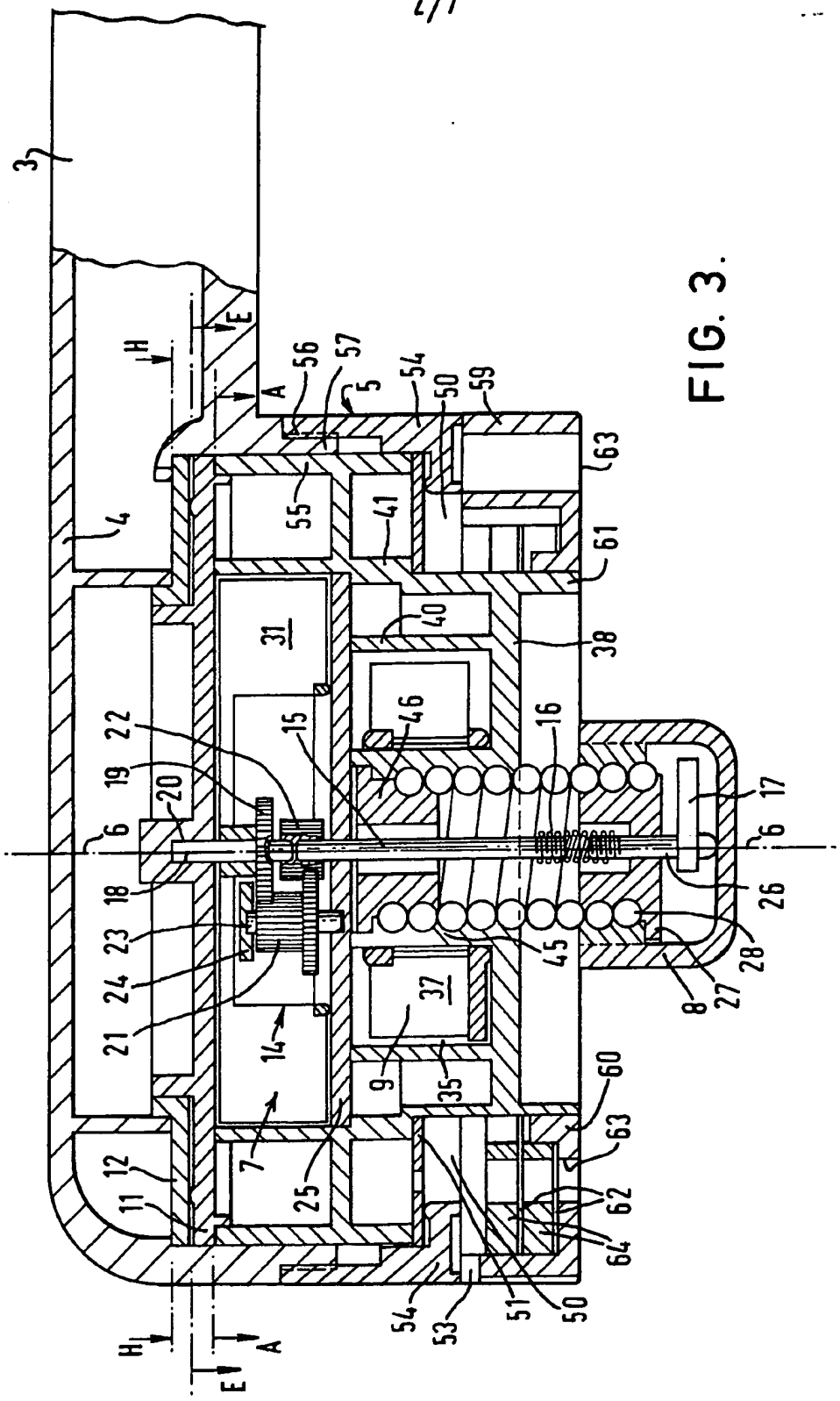
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FIG. 3.

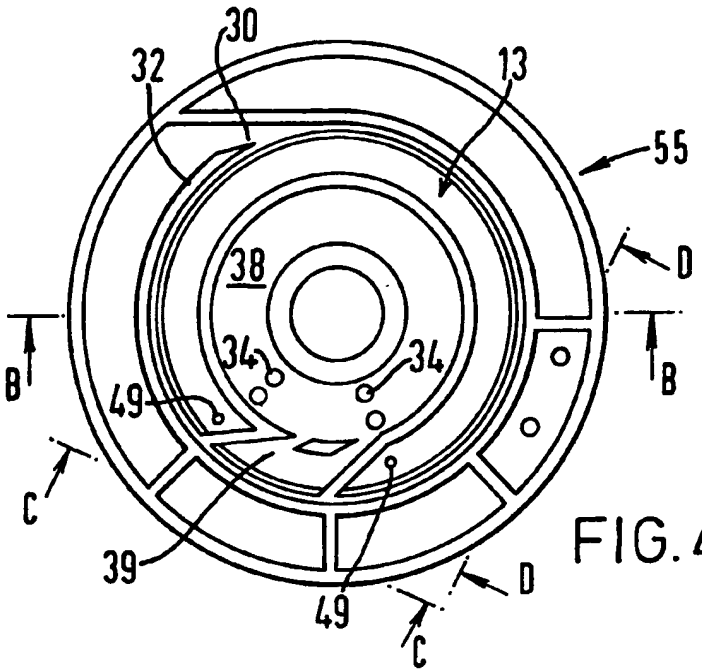


FIG. 4.

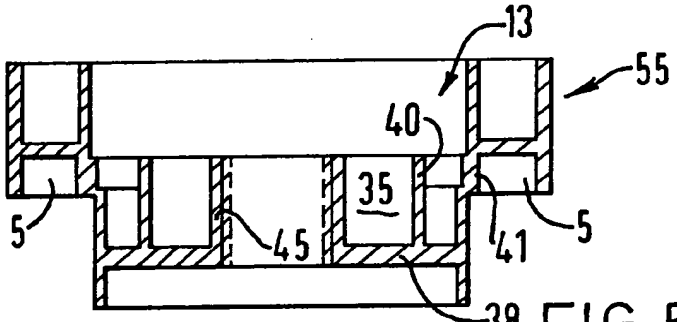


FIG. 5.

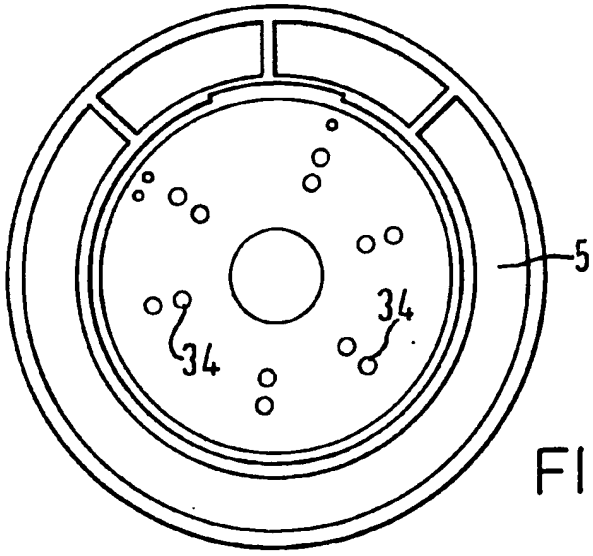


FIG. 6.

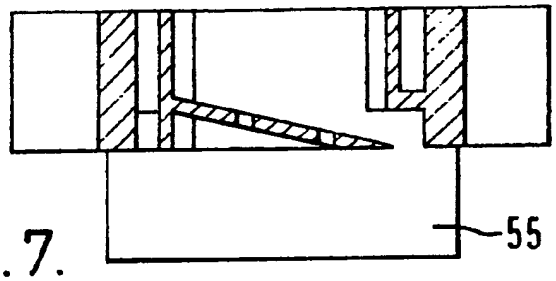


FIG. 7.

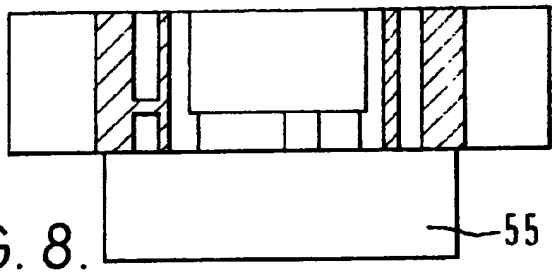


FIG. 8.

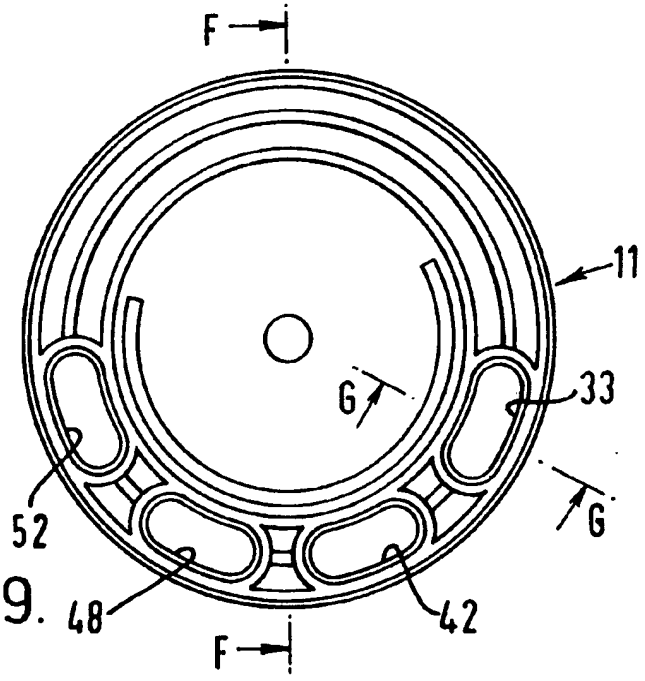


FIG. 9.

FIG.10.

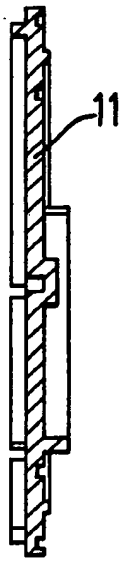


FIG.11.

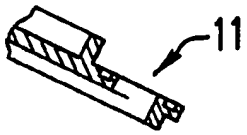
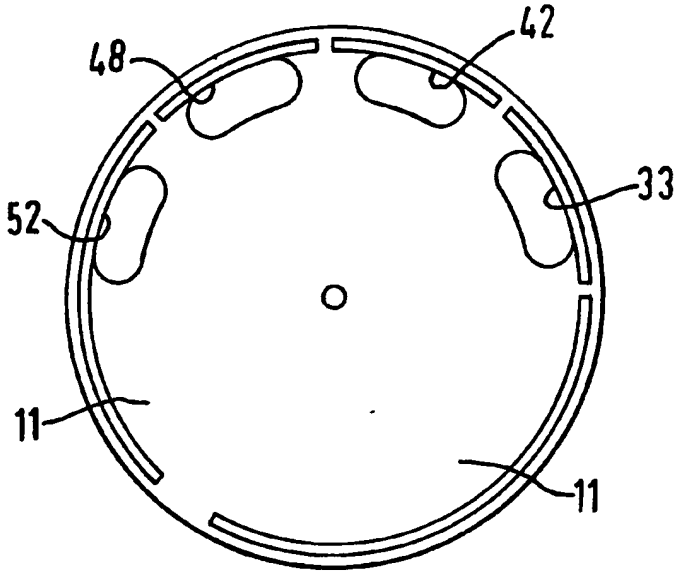


FIG.12.



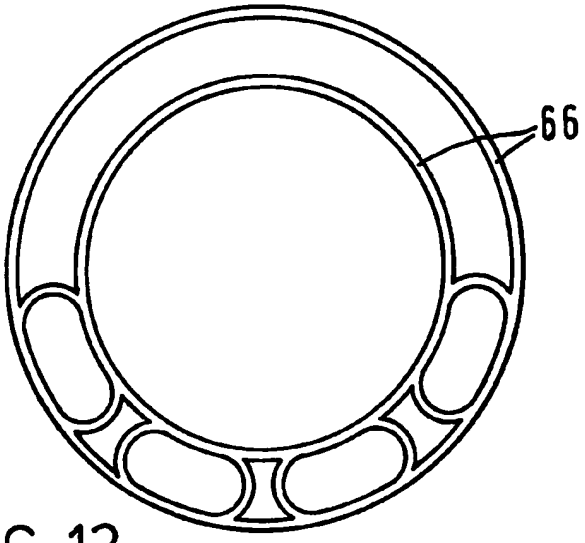


FIG. 13.

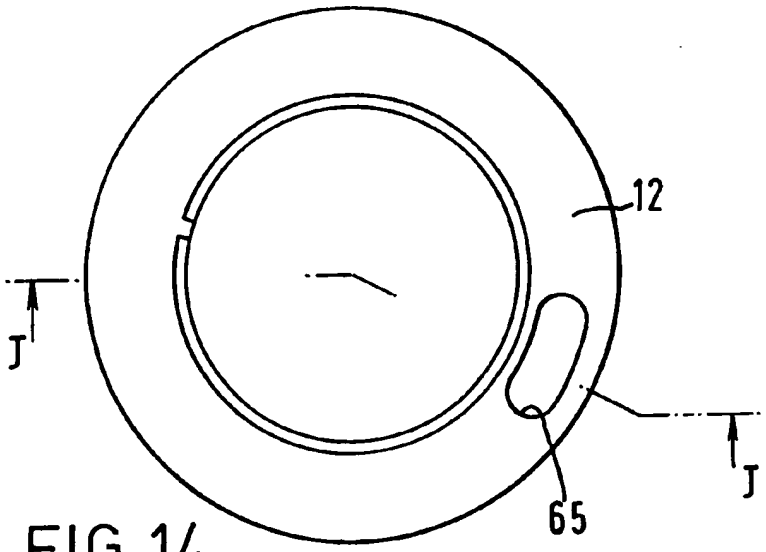


FIG. 14.

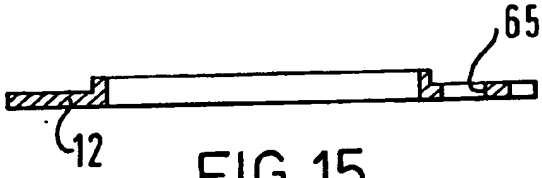


FIG. 15.

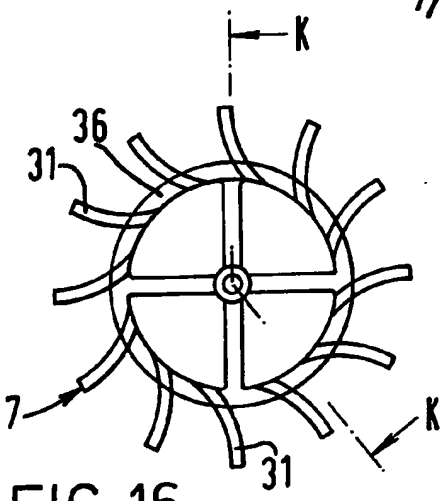


FIG. 16.

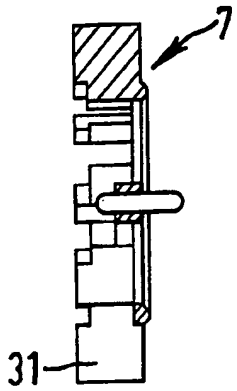


FIG. 17.

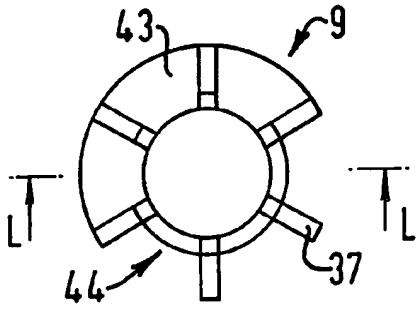


FIG. 18.

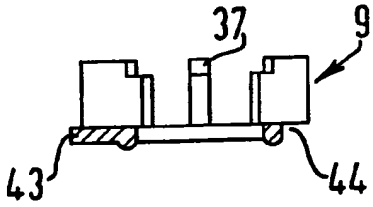


FIG. 19.

SPECIFICATION

Shower spray head

This invention relates to a show spray head for connection to a source of fluid under pressure such as a domestic water supply for domestic bathroom use.

Such a shower spray head has been proposed incorporating means for imparting vibration to a part thereof in conjunction with a fluid spray. However, such proposed shower spray heads do not develop sufficient vibration to render them suitable for operating attachments such as a hairbrush or a facial massage device at effective vibratory levels. Moreover, it is difficult with existing and proposed shower spray heads to incorporate additional fluid flow spray modes of operation.

There is thus a need for a generally improved shower spray head.

According to the present invention there is provided a shower spray head having a first housing part for attachment to a source of fluid under pressure and a second housing part movably attached to the first housing part for selective pivotal movement about a first axis, which second housing part includes a vibratory means with a vibrator turbine rotor rotatable about the first axis to cause vibration of a vibrator portion to which an accessory to be vibrated can be removably attached, includes a pulsation means with a pulsator turbine rotor rotatable about the first axis to open and close pulsator flow passages, and includes an apertured valve plate co-operable with valve port means on the first housing part to provide four fluid flow paths, so that, with the first housing part connected to a source of fluid under pressure, the second housing part can be selectively pivotally moved about the first axis to positions providing at least either a first of the fluid flow paths in which the vibrator turbine rotor is driven by the fluid to produce vibration of the vibrator portion, a second of the fluid flow paths in which the pulsator turbine rotor is driven by the fluid to produce a pulsating fluid flow, a third of the fluid flow paths which produces a non-pulsating fluid flow, or a fourth of the fluid flow paths which produces an aerated fluid flow.

For a better understanding of the present invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 is a side view of a shower spray head according to one embodiment of the present invention,

Figure 2 is a plan view from below of the shower spray head of Fig. 1,

Figure 3 is a vertical diametrical cross sectional view, to an enlarged scale, through part of the shower spray head of Fig. 1,

Figure 4 is a view from above taken on the line A—A of Fig. 3 of a second housing part of the shower spray head of Figs. 1 to 3,

Figure 5 is a vertical diametrical cross sectional view taken on the line B—B of Fig. 4,

Figure 6 is a view from below of the second housing part of Fig. 4,

Figure 7 is a vertical cross sectional view taken on the line C—C of Fig. 4,

Figure 8 is a vertical cross sectional view taken on the line D—D of Fig. 4,

Figure 9 is a view from above of an apertured valve plate taken on the line E—E of Fig. 3,

Figure 10 is a diametral cross sectional view taken on the line F—F of Fig. 9,

Figure 11 is a part cross sectional view taken on the line G—G of Fig. 9,

Figure 12 is a view from underneath of the apertured valve plate of Fig. 9,

Figure 13 is a plan view from above of a sealing ring means locatable between the apertured valve plate of Figs. 9 to 12 and a first housing part of the shower spray head of the invention,

Figure 14 is a plan view from above taken along the line H—H of Fig. 3 of valve port means of a first housing part of the shower spray head of the invention,

Figure 15 is a cross sectional view taken on the line J—J of Fig. 14,

Figure 16 is a plan view from above of a vibrator turbine rotor of the shower spray head of Figs. 1 to 15,

Figure 17 is a cross sectional view taken on the line K—K of Fig. 16,

Figure 18 is a plan view from above of a pulsator turbine rotor of Fig. 3, to a reduced scale, and

Figure 19 is a cross sectional view taken on the line L—L of Fig. 18.

As shown in the accompanying Figs. 1 to 19 of the drawings a shower spray head, generally referenced 1, of the present invention is adapted for attachment to a source of fluid under pressure such as to a flexible water-pipe or hose by an inlet connector 2 and is adapted for hand-held use by means of a hollow handle portion 3 forming part of a first housing part 4. A second housing part 5 is movably attached to the first housing part 4 for selective pivotal movement about a first axis 6. The second housing part 5 includes a vibratory means with a vibrator turbine rotor 7 rotatable about the first axis 6 to cause vibration of a vibrator portion 8 to which an accessory to be vibrated, such as a hairbrush or a facial massage device, can be removably attached.

The second housing part 5 also includes a pulsation means with a pulsator turbine rotor 9 rotatable about the first axis 6 to open and close pulsator flow passages 34. An apertured valve plate 11 is provided on the second housing part 5 for co-operation with valve port means 12 on the first housing part four

to provide 4 fluid flow paths.

Thus with the first housing part 4 connected to a source of fluid under pressure via th inlet conn ctor 2, th s cond housing part 5 can b selectively pivotally moved about the first axis 6 to positions providing at least either a first of th fluid flow paths in which the vibrator turbine rotor 7 is driven by the fluid to produce vibration of the vibrator portion 8, a second of the fluid flow parts in which the pulsator turbine rotor 9 is driven by the fluid to produce a pulsating fluid flow, a third of the fluid flow paths which produces a non-pulsating fluid flow, or a fourth of the fluid flow paths which produces an aerated fluid flow.

The vibrator turbine rotor 7 is housed in a vibrator chamber 13 defined by walls in the second housing part 5 and is connected via step-up gearing 14 to one end of a vibrator shaft 15. The other end of the vibrator shaft 15 is connected via a spring 16, conveniently a coil spring, to an eccentric member 17 movably housed in the vibrator portion 8 so that rotation of the eccentric member 17 produces vibration of the vibrator portion 8.

The step-up gearing is necessary to increase the rotational speed of the shaft 15 considerably above that of the vibrator turbine rotor 7 in order to create a greater vibration than would otherwise be possible in the absence of the step-up gearing 14. To this end the vibrator turbine rotor 7 is mounted on a stub shaft 18 in axial alignment with the first axis 6 and the rotational axis of the shaft 15 and carries fixedly connected thereto a drive gear 19. The stub shaft 18 is rotational mounted at its end remote from the end carrying the drive gear 19, in a bearing 20 provided in the apertured valve plate 11. The drive gear 19 is in meshing engagement with a small gear of a double gear 21 whose large gear is in meshing engagement with a small gear 22 fixedly connected to the end of the shaft 15 projecting into the chamber 14. The double gear 21 is fixed to a gear shaft 23 rotatively journalled at its ends in a frame member 24 and a wall 25 bounding the side of the chamber 14 remote from the apertured valve plate 11.

The end of the stub shaft 18 carrying the drive gear 19 conveniently is freely rotatively journalled in the small gear 22 as shown in Fig. 3. The angular speed of the small gear 22 is four times greater than the angular speed of the drive gear 19 and the rotor 7. The shaft 15 is connected via the spring 16 to a cam shaft 26 which carries the eccentric member 17 in such a way that the centre of mass of the eccentric member or cam 17 is not on the first axis 6 of the cam shaft 26. Rotation of the eccentric member 17 consequent to rotation of the vibrator turbine rotor 7 will creat centrifugal force on a nut 27 of the vibrator portion 8, in which nut the shaft 26 is journalled. This centrifugal f rce acts perpendicular to the cam shaft 26 and creates vibration in a plan substantially perpendicular to the axis of the shaft 26. As the nut 27 is fixedly attached to a vibrating coil spring 28 and to a further nut 29 attached to the outer part of the vibrator portion 8, the whol vibrat r portion 8 vibrat s in synchronism with the vibration of the cam shaft 26 and eccentric member 17 about the connecting spring 16. The coil spring 28 not only connects the vibrator portion 8 to the second housing part 5 as will hereinafter be described, by also acts as a returning force device usually found on most mechanical vibration systems.

The vibrator chamber 13 has an inlet aperture 30 opening tangentially to the rotor 7 or at an angle to blades 31 of the rotor 7 through one wall 32 of the chamber 13. The inlet aperture 30 opens onto the rotor 7 in the chamber 13 from the apertured valve plate 11 for communication with an aperture 33 therethrough as will be hereinafter described. The chamber 13 also has at least one outlet aperture (not shown) preferably a plurality of which are arranged in circular and radial array through the lowermost wall 25 of the chamber 13 to communicate with a pulsator chamber 35 located co-axially with the chamber 13 and immediately below it in the direction of the vibrator portion 8. As fluid flow entering the chamber 13 through the inlet aperture 30 must necessarily strike the blades 30 of the rotor 7 at an angle, rotation is imparted to the rotor 7 thereby. Fluid striking and displacing the blades 31 of the rotor 7 is deflected inwardly of the blades 31 in the direction of the centre of the rotor 7 and passes through openings 36 between the blades 31 and downwardly through an open base part of the rotor 7 and hence through the vibrator chamber outlet apertures from the chamber 13.

The fluid flow leaving the chamber 13 through the outlet apertures enters the pulsator chamber 35 in a direction generally parallel to the axis 6, passes between blades 37 of the pulsator turbine rotor 9 without rotating the latter and passes out of the chamber 35 through outlet apertures 34 provided in a base wall of the chamber 35. The fluid passing through the outlet apertures 34 thus passes through an exterior wall 38 of the second housing part to exhaust to atmosphere in the form of a fluid spray.

The pulsator chamber 35 also has an inlet aperture 39 opening tangentially to the blades 37 of the rotor 9 or at an angle thereto through walls 40 and 41 into the chamber 35. The inlet aperture 39 communicates through the walls 40 and 41 with an aperture 42 in the apertured valve plate 11 whereby the rotor 9 can be put in driven communication with a flow of fluid under pressure as will hereinafter be described. Fluid entering the chamber 35 through the inlet apertur 39

strikes the blades 37 of the rotor 9 at an angle ther by causing the rotor 9 to rotate and passes radially inwardly of the rotor 9 towards the base thereof. As can b seen from Figs. 18 and 19 the r tor 9 has a base which has a closed half 43 and an open half 44. In this way fluid can only pass downwardly of the rotor 9 during one half of its circumference when the open half 44 thereof uncovers the pulsator flow passages or outlet apertures 34. Therefore when the rotor 9 is rotating the fluid exiting from the outlet apertures 34 does so in a pulsating manner to provide a pulsating fluid spray. Thus the closed half base 43 and the open half base 44 of the rotor 9 together form an apertured valve face operable sequentially to open and close pulsator flow passages formed by the outlet apertures 34 from the pulsator chamber 35. As can be seen from the drawings the pulsator turbine rotor 9 is located co-axially with the vibrator shaft 15 for unconnected rotation therearound on the first axis 6.

To this end the rotor 9 is carried on a central neck portion 45 of the second housing part 5, which central neck portion 45 fixedly locates one end of the spring 28 between its inntermost surface and a nut 46 engaged screwably in the neck portion 45. This nut 46 has an apertured central opening therein through which the shaft 15 extends.

The second housing part 5 also provides a non-pulsating fluid flow chamber 47 defined between the walls 40 and 41 and located radially outwardly of the pulsator chamber 35. The non-pulsating fluid flow chamber 47 opens through the apertures in the wall 41 onto the apertured valve plate 11 for co-operation with an aperture 48 in the valve plate 11. The chamber 47 opens through the exterior wall 38 of the second housing part 5 through outlet apertures 49 provided therein radially outwardly of the outlet apertures 34 opening from the pulsator chamber 35.

An aerated fluid flow chamber 50 also is provided in the second housing part 5. This chamber 50 is located radially outwardly of the non-pulsating fluid flow chamber 47 and opens through an apertured wall 51 thereof on to the apertured valve plate 11 for co-operation with an aperture 52 therein. At least one air inlet hole 53 is provided through a flanged threaded ring 54 by means of which a central body part 55 of the second housing part 5 is attached to the first body part 4. The ring 54 has a threaded portion 56 engaging corresponding screw threads provided on a projecting annular surface 57 of the first housing part 4. The end of the ring 54 remote from the threaded portion 56 is provided with a radially inwardly extending flang 58 which engages the outermost surface of the apertur d wall 51 so as to locat the central body part 55 of the second housing part 5 securely for pivotal movement with respect to th first housing part 4. The apertured wall 51 may b provid d, as shown in Fig. 3, by an annular sheet located against appropriate should surfaces n the central b dy part 55.

The air inlet hole 53 provided through a peripheral wall of the second housing part 5 radially to the vibrator shaft 15 may be formed through the ring 54 or may be formed through a further flanged ring 59 fixedly secured at its radially innermost surface 60 to a projecting annular neck 61 provided on the central body part 55 of the second housing part 5. This further ring 59 slidingly engages against the ring 54 and can be turned manually by a user of the shower spray head 1 to turn the second housing part 5, particularly the central body part 55 thereof, to select one of the four fluid flowpaths as desired, as will be hereinafter described. Conveniently, as shown in Fig. 3, the air inlet hole 53 is provided at the junction of the rings 54 and 59 and is bounded by surfaces of both these rings.

This air inlet hole 53 opens from the atmosphere on the exterior of the peripheral wall of the second housing part 5 provided by the rings 54 and 59 radially into the aerated fluid flow chamber 50 so that air can be drawn from the exterior atmosphere into the chamber 50 through the hole 53 and entrained in the chamber 50 in fluid passing therethrough from the apertured wall 51. To facilitate the intermixing of the air and fluid in the chamber 50 at least one intermediate mixing gauze 62 is provided on the outlet side of the chamber 50, through which gauze the aerated of water passes on its way to outlet apertures 63 provided in the ring 59 radially outwardly of the apertures 49 from the non-pulsating chamber 47. The gauze 62, in the form of a sheet metal-or plastics-mesh, is located within the chamber 50 between 2 spacer rings 64 located in the chamber 50 by the ring 59.

As hereinbefore described the apertured valve plate 11 is fixedly secured to the central body part 55 of the second housing part 5 so that its apertures 33, 42, 48 and 52 therethrough correspond respectively to the flow paths through the chambers 13, 35, 47 and 50. The apertured valve plate 11 co-operates with the valve port means 12 provided on the first housing part in which there is one single valve port 65 as shown in Figure 14. This valve port means 12 conveniently is an annular disc fixedly secured to the first housing part 1. The apertured valve plate 11, with the interposition of a sealing ring means, which preferably is a resilient natural or synthetic rubber ring m ans 66 as shown in Fig. 13, is located so that the four arcuately spaced inlet apertures 33, 42, 48 and 52 in th valve plate 11 face towards the valve port 65 provid d through the valv p rt means 12. The sealing ring means 66 provides a sliding

bearing surface between the valve plate 11 and the valve port means 12 so that the valve plate 11 can be pivotally displaced by pivotal movement of the central body part 55 of the second housing part 5 about the axis 6 in response to manual rotation of the ring 59. The apertures 33, 42, 48 and 52 of the valve plate 11 are so located that they can be brought, in turn, into conjunction with the valve port 65 in the valve port means 12 so as to direct fluid, in operation passing through the hollow handle portion 3 and first housing part 4 of the shower spray head 1, into the appropriate selected desired fluid flow paths.

Instead of a single intermediate mixing gauze 62 a pair of such gauzes may be provided in spaced relationship as shown in Fig. 3. Although not previously stated it is to be understood that in the illustrated embodiment of the invention the vibrator chamber outlet apertures, pulsator chamber outlet apertures 34, non-pulsating fluid flow chamber outlet apertures 49 and aerated fluid flow chamber outlet apertures 52 are directed substantially parallel to the axis 6 so that fluid flowing therefrom flows passed the vibrator portion 8 and any attachment connected thereto. However, if desired, these outlet apertures can be given a particular angle of inclination in order to provide a particular desired flow effect and direction. Conveniently the shower spray head 1 illustrated is made from plastics material wherever possible in order to provide adequate resistance to corrosion by the fluid flowing therethrough, although the springs 16 and 28 may be made of any convenient corrosion resistant metal such as stainless steel. Although not shown an on-off tap may be inserted in the flow passage in the hollow handle portion 3 of the spray head 1 in order to control the flow of fluid therethrough. It is to be noted that although the first and second housing parts 4 and 5 respectively have been shown as having a circular cross section they may be of any other conveniently shaped cross section provided that it is possible still to pivotally move the second housing part 5 with respect to the first housing part 4.

The illustrated embodiments of the invention operates as follows. With the handle portion 3 connected to a force of fluid under pressure such as a domestic water supply, via the connector 2, water will flow through the hollow handle portion 3 to the valve port means 12. When the ring 59 is pivotally moved about the axis 6 to a position in which the valve port 65 is in communication with the valve plate aperture 33 water will flow from the first housing part 4 through the aligned valve port 65 and valve plate aperture 33 and pass into the vibrator chamber 13 through a side wall thereof to impinge tangentially or at an angle on the rotor blades 31 and hence rotate the vibrator turbine rotor 7. Rotation of the rotor 7 will be transmitted and stepped up via the gearing 14, shaft 15 and spring 16 to the eccentric member 17 causing the latter to rotate and vibrate. This vibration will thereby be imparted to the vibrator portion 8 causing it and any attachment secured thereon, to vibrate. The vibratory movement of the portion 8 takes place in a plane substantially at right angles to the axis 6 and is enhanced by the return movement produced by the spring 28 connecting the vibrator portion 8 to the central body part 55. In this way an attachment such as a hairbrush on the vibrator portion 8 can be caused to vibrate, for example for shampoo purposes. At the same time water will flow around the vibrator portion 8. This water flow is provided by the water flowing from the chamber 13 through the vibrator chamber outlet apertures, through the pulsator chamber 35 substantially parallel to the axis 6 and thus passing between the blades 37 of the rotor 9 without producing any drive movement thereof, and out of the shower head through the outlet apertures 34.

Turning the central body part 55 to the next position brings the valve port 65 and valve plate aperture 42 into alignment, thereby cutting off flow to the vibrator turbine rotor 7 which thus stops rotating and the vibrator portion 8 stops vibrating. The communicating valve port 65 and valve plate aperture 42 cause the water to flow now only through the walls 40 and 41 into the side of the pulsator chamber 35 to strike the blades 37 of the rotor 9 tangentially or at an angle thereto and thus cause this rotor 9 to rotate. By rotating, the rotor 9 succesively covers and uncovers the outlet apertures 34 so that water flowing therethrough does so in a pulsating manner.

Movement of the central body part 55 to bring the valve port 65 and valve plate aperture 48 into communicating alignment cuts off the flow of water to pulsator chamber 35 and thus stops rotation of the rotor 9 and the pulsating water flow from the apertures 34. The water now flows through the aligned valve port 65 and valve plate aperture 48 into the non-pulsating flow fluid chamber 47 from which it escapes in a non-pulsating flow through the outlet apertures 49.

Turning the central body part 55 by means of the ring 59, to bring the valve port 65 and valve plate aperture 52 into communicating alignment cuts off the flow of water to the chamber 47 and instead directs the water into the aerated fluid flow chamber 50. As the water passes through this chamber 50 and through the gauze or gauzes 62 it entrains air from the exterior to the inlet hole 53 to produce air bubbles in the water flow issuing from the outlet apertures 63, to soften the impact of this water flow on a user of the shower spray head 1.

If desired a further position may be provid d for the apertured valve plate 11 in which no one of its ap rtures communicates with the valve port 65 thereby to act as a shut-off position preventing any water flowing through the shower spray head.

If desired two immediately adjacent valve plate apertures may be put in simultaneous part communication with the valve port 65 to provide a combination of the respective two flow paths served by the selected valve plate apertures.

CLAIMS

1. A shower spray head having a first housing part for attachment to a source of fluid under pressure and a second housing part movably attached to the first housing part for selective pivotal movement about a first axis, which second housing part includes a vibratory means with a vibrator turbine rotor rotatable about the first axis to cause vibration of a vibrator portion to which an accessory to be vibrated can be removably attached, includes a pulsation means with a pulsator turbine rotor rotatable about the first axis to open and close pulsator flow passages, and includes an apertured valve plate co-operable with valve port means on the first housing part to provide four fluid flow paths, so that, with the first housing part connected to a source of fluid under pressure, the second housing part can be selectively pivotally moved about the first axis to positions providing at least either a first of the fluid flow paths in which the vibrator turbine rotor is driven by the fluid to produce vibration of the vibrator portion, a second of the fluid flow paths in which the pulsator turbine rotor is driven by the fluid to produce a pulsating fluid flow, a third of the fluid flow paths which produces a non-pulsating fluid flow, or a fourth of the fluid flow paths which produces an aerated fluid flow.

2. A shower spray head according to claim 1, wherein the vibrator turbine rotor is housed in a vibrator chamber defined by walls in the second housing part, and is connected *via* step-up gearing to one end of a vibrator shaft the other end of which is connected *via* a spring to an eccentric member, rotation of which member produces vibration of the vibrator portion.

3. A shower spray head according to claim 2 wherein the vibrator chamber has an inlet aperture opening tangentially to the rotor or at an angle to blades of the rotor through one wall thereof onto the vibrator turbine rotor from the apertured valve plate and at least on outlet apertur opening through another wall ther of, in the g neral direction of the first axis, to the pulsator turbine rotor.

4. A shower spray head acc rding to claim 2 or claim 3, wherein the pulsator turbine rotor is housed in a pulsator chamber defined by walls in the s cond h using part, which pulsator chamber has an inlet aperture opening tangentially to the rotor or at an angle to blades of the rotor through ne wall of the pulsator chamb r onto the pulsator turbine rotor from th apertur d valve plate.

5. A shower spray head according to claim 4, wherein the pulsator turbine rotor is located co-axially with the vibrator shaft for unconnected rotation therearound and has an apertured valve face operable sequentially to open and close the pulsator flow passages formed by at least one outlet aperture opening from the pulsator chamber through an exterior wall of the second housing part, to produce in operation, a pulsating fluid flow through the pulsator chamber outlet aperture.

6. A shower spray head according to claim 5, wherein a non-pulsating fluid flow chamber is provided in the second housing part radially outwardly of the pulsator chamber, which non-pulsating fluid flow chamber opens through an apertured wall thereof on to the apertured valve plate and opens to the exterior of the second housing part through outlet apertures provided through the exterior wall of the second housing part radially outwardly of the at least one outlet aperture opening from the pulsator chamber.

7. A shower spray head according to claim 6, wherein an aerated fluid flow chamber is provided in the second housing part radially outwardly of the non-pulsating fluid flow chamber, which aerated fluid flow chamber opens through an apertured wall thereof on to the apertured valve plate, opens radially to the vibrator shaft through at least one air inlet hole in a peripheral wall of the second housing part to atmosphere, and, *via* at least one intermediate mixing gauze, through outlet apertures provided through the exterior wall of the second housing part radially outwardly of the non-pulsating fluid flow outlet apertures.

8. A shower spray head according to claim 7, wherein the apertured valve plate has four arcuately spaced inlet apertures therethrough and is fixedly connected to the innermost end of the second housing part with each inlet aperture in communication with a respective one of the four chambers, there being sliding sealing means between the apertured valve plate and a wall of the first housing means having the valve port means.

9. A shower spray head according to claim 8, wherein the valve port means has a port provided through a wall of the first housing part in communication with an inlet flow passage connectible to a source of fluid under pressure.

10. A shower spray head according to any ne of claims 1 to 9, wherein the second housing part is removably connected to the first housing part by means f a flanged threaded ring engaged around the second housing part and engaging corresponding

screw threads provided on a proj cting annular surface of the first housing part.

11. A shower spray head substantially as hereinbefore described with reference to the accompanying drawings.

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